

Water-based medium-expansion foam depopulation of adult cattle

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Introduction

Current options for depopulation of adult cattle outlined in the “AVMA Guidelines for the Depopulation of Animals” are limited, have logistic constraints, and may not be practical on a large scale. Water-based foam is advantageous because the necessary equipment is readily available, easy to use and presents minimal personnel risk. Foam has been successfully used to depopulate poultry but no research has been conducted on cattle.

Materials and methods

With the use of a modified rendering trailer in a field setting, we evaluated the efficacy of aspirated water-based foam for depopulation of adult cattle. Animals were immersed in non-toxic foam to block respiratory exchange of gases and a gated approach with anesthetized cattle was used prior to conscious replicates. A total of 84 head of cattle was used and a subset was implanted with subcutaneous telemetry devices that recorded activity and electrocardiograms. In all trials, cattle were loaded onto the trailer using a single-file ramp and 3 gasoline-powered pumps delivered foam into the trailer with a 15 min foam dwell period.

Results

Average (\pm SD) time to completely fill the trailer was 85 ± 10 s. Average (\pm SD) time from container fill to last movement subjectively heard by observers was 187 ± 70 s. No animal vocalizations were heard during foam application or the dwell period, and all animals were confirmed dead upon removal from the container at 15 min. Necropsies of the first 12 cattle revealed foam extending to at least the tracheal bifurcation and exceeding this level in 67% (8/12) animals. Average (\pm SD) time for cessation of movement as determined by activity data was 151.8 ± 76.4 s.

Significance

The results of this study indicate water-based foam is a rapid, effective, and safe method for depopulation of adult cattle with potential operational advantages over current methods.

